

### **Remarks**

Claims 1, 7 and 8 are canceled herein. Claims 24, 47, 49 and 51-57 are amended herein.  
New claims 60-67 are added herein.

Support for the amendment of claim 24 can be found throughout the specification, for example at page 4, lines 23-26 and on page 22. Claims 47, 49 and 51-57 are amended to be directed to probes that "consist of" the recited nucleic acid sequence.

New claims 60-63 depend from allowed claim 58. Claim 58 is directed to SEQ ID NO: 6 and SEQ ID NO: 7; new claims 60-63 are directed to SEQ ID NO: 6 and SEQ ID NO: 7 individually. Support for new claims 64-67 can be found throughout the specification, for example at page 7, lines 15-27.

### **Allowable subject matter**

Applicants thank the Examiner for indicating that claims 58 and 59 are allowed.

### **Telephone conference**

Applicants thank Examiner Goldberg for the helpful telephone conference of August 8, 2005, wherein the allowable subject matter was discussed. Applicant further discussed with Examiner Goldberg the possibility of submitting a declaration.

### **Priority**

The specification is amended herein to indicate the parent application has issued as U.S. Patent No. 6,372,430. Applicants submit that this amendment overcomes the objection to the specification.

### **Drawings**

Applicants thank the Examiner for confirming that the drawings have been accepted.

### **Specification**

The title of the application is amended herein to “Nucleic Acids for Detecting Fusarium Species.” Applicants believe that this amendment overcomes the objection that the title is not indicative of the claimed subject matter.

### **Rejections Under 35 U.S.C. § 112, second paragraph**

Claims 1, 7, 8 and 51-54 are rejected as allegedly being indefinite for being unclear as to whether the claimed probe does not hybridize to one or all of the recited species. Claims 1, 7, and 8 are canceled herein. Claim 51 is amended herein to be limited to probes that “consist of” a nucleic acid sequence set forth as SEQ ID NO: 49, SEQ ID NO: 50 or SEQ ID NO: 51. Applicants believe that the amendment of claim 51 renders the rejection moot as applied to claim 51 and dependent claims 52-54.

Claims 7, 8, 24, 30, 31, 47 and 49 are rejected as allegedly “a complementary sequence” is indefinite. Claims 7 and 8 are canceled herein, rendering the rejection moot as applied to these claims. Applicants respectfully disagree with this rejection as applied to claims 24, 30, 31, 47 and 49. However, solely to advance prosecution, claims 24, 31, 47 and 49 are amended herein to recite “the complement,” as suggested in the Office action.

Claims 24, 30, 31, and 55-57 are rejected as allegedly not being clear as to whether these claims are directed to detecting a Fusarium generically or are directed to detecting a specific

*Fusarium* species. Applicants have amended these claims to clarify the intent of the claimed methods. Claims 24, 30-31 and 55-57 are amended to clarify the *Fusarium* species detected in the claimed methods. Applicants believe that the amendment of claims 24, 30-31 and 55-57 renders the rejection moot.

Claims 47 and 49 are rejected as allegedly being indefinite for the recitation of “respectively.” Claims 47 and 49 are amended herein to delete this term, rendering the rejection moot.

### **Rejections Under 35 U.S.C. § 102**

Claims 1, 47, 51, 53 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Duggal et al. (GenBank Accession No. U28159). Claim 1 has been canceled, rendering the rejection moot as applied to this claim. Applicants respectfully disagree with this rejection as applied to the claims 47, 51 and 53 as amended.

The Office action states that this rejection is made as “consisting essentially of” has been construed to be equivalent to “comprising.” Claims 47, 51 and 53 have been amended to recite “consisting of.”

Duggal et al teach the nucleotide sequence of the ITS1 region of *Fusarium oxysporum*, which includes nucleotides (identified as 441-455) that are identical to 15 nucleotides of SEQ ID NO: 59 and includes nucleotides (identified as nucleotides 338-355) that are identical to SEQ ID NO: 50. However, Duggal et al. do not teach the nucleotide sequence of the ITS2 region of *Fusarium oxysporum*. In addition, Duggal et al. does not suggest the production of a particular primer, let alone a nucleic acid consisting of SEQ ID NO: 59 or SEQ ID NO: 50. Furthermore, Duggal et al. does not suggest detection methods, let alone detection method utilizing a nucleic

acid consisting of SEQ ID NO: 59 or SEQ ID NO: 50. Applicants submit that Duggal *et al.* does not anticipate, or render obvious, claims 47, 51, and 53 as amended. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1, 47, 51 and 54 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Duggal *et al.* (GenBank Accession No. U38558). Claim 1 has been canceled, rendering the rejection moot as applied to this claim. Applicants respectfully disagree with this rejection as applied to the claims 47, 51 and 54 as amended.

The Office action states that this rejection is made as “consisting essentially of” has been construed to be equivalent to “comprising.” Claims 47, 51 and 54 have been amended to recite “consisting of.” GenBank Accession No. U38558 teaches the nucleotide sequence of a region of *Fusarium solani*, which allegedly includes nucleotides that are identical to 15 nucleotides of SEQ ID NO: 59 and 15 nucleotides identical to SEQ ID NO: 51. However, GenBank Accession No. U38558 does not suggest the production of a particular primer, let alone a nucleic acid consisting of SEQ ID NO: 59 or SEQ ID NO: 51. In addition GenBank Accession No. U38558 does not suggest detection methods, let alone detection methods using a nucleic acid consisting of SEQ ID NO: 51 or SEQ ID NO: 59. Applicants submit that GenBank Accession No. U38558 does not anticipate, or render obvious, claims 47, 51, and 54 as amended. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1, 7-8, 24, 30-31, 47 and 49 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Ligon *et al.* (PCT Publication No. WO 95/29260, November 1995). Claims 1 and 7-8 have been canceled, rendering the rejection moot as applied to these claims. Applicants respectfully disagree with this rejection as applied to the claims as amended.

The Office action states that this rejection is made as “consisting essentially of” has been construed to be equivalent to “comprising.” Claims 24, 30-31, 47 and 49 have been amended to recite that the probes (or nucleic acid sequences) “consist of” the claimed nucleic acid sequences.

Ligon *et al.* teaches an ITS nucleic acid sequence from *Fusarium graminearum*, *Fusarium culmorum* and *Fusarium moniliforme*, and teach the nucleic acid sequence of a primer that binds both *Fusarium graminearum* and *Fusarium culmorum*. The Office action also asserts that nucleotides 456 to 474 of SEQ ID NO: 82 from Ligon *et al.* are identical to nucleotides 1-18 of SEQ ID NO: 59. Ligon *et al.* also does not disclose the sequence of primers that can be used to differentiate *Fusarium oxysporum*, *Fusarium solani* and *Fusarium moniliforme*, let alone the production of a primer that “consists of” SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51 or SEQ ID NO: 59.

Thus, Applicants submit that Ligon *et al.* does not anticipate, nor render obvious claims 24, 30-31, 17 and 49. Reconsideration and withdrawal of the rejection are respectfully requested.

### **Rejections Under 35 U.S.C. § 103**

Claims 55-57 are rejected under 35 U.S.C. § 103 (a) as allegedly being obvious over Ligon *et al.* in view of Duggal *et al.* or GenBank Accession No. U38588, further in view of Hogan *et al.* (U.S. Patent No. 5, 595, 874). Applicants respectfully disagree with this rejection as applied to the claims 55-57 as amended.

Ligon *et al.* is discussed above. Ligon *et al.* teaches methods of identifying fungal isolates, and describes the DNA sequences of the ITS region of several *Fusarium* species. However, Ligon *et al.* does not teach primers that differentiate *Fusarium oxysporum*, *Fusarium*

*solani* and *Fusarium moniliforme*, let alone a nucleotide sequence consisting of SEQ ID NO: 49, SEQ ID NO: 50 or SEQ ID NO: 51.

Duggal *et al.* discloses a nucleotide sequence comprising SEQ ID NO: 59 and SEQ ID NO: 50. Duggal *et al.* does not teach the nucleotide sequence of the ITS2 region of *Fusarium oxysporum*. In addition, Duggal *et al.* does not suggest the production of a particular primer, let alone a nucleic acid consisting of SEQ ID NO: 59 or SEQ ID NO: 50. Furthermore, Duggal *et al.* does not suggest detection methods, let alone a detection method utilizing a nucleic acid consisting of SEQ ID NO: 59 or SEQ ID NO: 50.

GenBank Accession No. U38558 discloses the nucleotide sequence of a region of *Fusarium solani*, which allegedly includes nucleotides that are identical to 15 nucleotides of SEQ ID NO: 59 and 15 nucleotides identical to SEQ ID NO: 51. However, GenBank Accession No. U38558 does not suggest the production of a particular primer, let alone a nucleic acid consisting of SEQ ID NO: 59 or SEQ ID NO: 51. In addition GenBank Accession No. U38558 does not suggest detection methods, let alone detection methods using a nucleic acid consisting of SEQ ID NO: 51 or SEQ ID NO: 59.

Hogan *et al.* teaches the use of specific primers that specifically bind rRNAs that are unique to a non-viral organism. Hogan *et al.* provide guidelines for primer selection that specifically bind the 16S rRNA. Hogan *et al.* do not describe methods for detecting *Fusarium*. Hogan *et al.* do not disclose the use of probes that bind the ITS2 region, let alone probes consisting of SEQ ID NO: 49, SEQ ID NO: 50 or SEQ ID NO: 51. Thus, Hogan *et al.* does not make up for the deficiencies of Ligon *et al.*, Duggal *et al.*, or GenBank Accession No. U38588.

Moreover, submitted herewith is the Declaration of Dr. Christine Morrison Under 37 C.F.R. § 1.132, which discloses that only a subset of probes produced from *Fusarium* ITS2

regions provide a strong reactivity with a single *Fusarium* species. This declaration describes the unexpectedly superior results that were obtained with probes consisting of SEQ ID NO: 49, SEQ ID NO: 50 and SEQ ID NO: 51. Applicants submit that this showing of unexpectedly superior results overcomes any *prima facie* case of obviousness.

Reconsideration and withdrawal of the rejection is respectfully requested.


### Conclusion

Applicants believe that the pending claims are in condition for allowance, which action is requested. If any minor matters remain to be addressed before a Notice of Allowance is issued, the Applicants request that Examiner Goldberg contact their undersigned representative for a telephone interview.

Respectfully submitted,

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